

Preliminary Amendment
Continuation of U.S. Application No. 09/254,864

Amendment to the Specification:

Before the first paragraph on page 1, please insert the following paragraph:

This nonprovisional application is a continuation of U.S. Application Number 09/254,864, filed March 15, 1999.

Please replace the first paragraph beginning on page 1, with the following amended paragraph:

The invention relates to a concentrator for voice telephones, accommodating the voice telephones, and the equivalent in Local Area Network (LAN) interfaces, and a method of communication over a LAN using the concentrators.

Please replace second paragraph beginning on page 1, with the following amended paragraph:

In a conventional method of internal communication within a business compound, voice communications have been provided by a PBX (private branch exchange) accommodating voice telephones, and data communications have been provided by a LAN, independently from each other. Along with a decline in prices of personal computers (referred to as PCs hereinafter) and higher performance thereof, the PCs have become popularized as much as ordinary voice telephones, particularly, in recent times. Consequently, an environment wherein voice telephones are integrated into a LAN has come to be desired for internal communication within a business compound.

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Please replace fourth paragraph beginning on page 1, and continuing on page 2 with the following amended paragraph:

In spite of an attempt to integrate an infrastructure for internal communications within a business compound by incorporating voice telephones into a LAN, it has been difficult to implement such integration because of the peculiarity of ‘voice’, such as periodicity, and the need for real time response contradicts characteristics of data communications, such as burst and high reliability. As a result, facilities for both a PBX and a LAN have been required, accompanied by installation of two wiring systems.

Page 2, between the first and second paragraphs, please replace the heading with the following rewritten heading:

DISCLOSURE SUMMARY OF THE INVENTION

Please replace the fourth paragraph beginning on page 3, with the following amended paragraph:

A method of communication according to a sixth aspect of the invention is carried out over a LAN comprising a plurality of LAN hubs accommodating equipment for performing data communication, a plurality of the aforesaid TLAs ~~as disclosed in Claim 4~~, and the LAN switching unit having a plurality of ports and for switching and

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connecting between the plurality of the LAN hubs and the plurality of the TLAs as follows.

Please replace the fifth paragraph beginning on page 4, with the following amended paragraph:

A method of communication according to a ninth aspect of the invention is carried out over a LAN comprising the plurality of LAN hubs accommodating equipment for performing data communication, the plurality of the TLAs ~~as disclosed in Claim 1~~, and the LAN switching unit having the plurality of ports and for switching and connecting between the plurality of the LAN hubs and the plurality of the TLAs as follows.

Please replace the third paragraph beginning on page 5, with the following amended paragraph:

With the TLA according to the third aspect of the invention, ~~wherein~~ signals from circuits of analog telephone network subscribers sent out by a general telephone are converted into call control protocols according to TCP-IP. That is, call control can be performed on the side of the telephone and TLA without the need of call control by the PC or work station.

Please replace the second paragraph beginning on page 10, with the following amended paragraph:

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In this embodiment of the invention, the MAC (Media Access Control) frame is used for a frame format. As shown in Fig. 3, the MAC frame consists of a preamble (PA) SFD (Start Frame Delimiter), hardware DA (Destination Address), hardware SA (Service Address), ETYPE, Data Block, and Frame Check Sequences (FCS). In the case of the voice switching system shown in Fig. 1, voice data are packetized, and a packetized voice frame is assembled by substituting the data block of the MAC frame with the ATM (Asynchronous Transfer Mode) · AAL type 1 (JT 1.363) frame. The ATM · AAL type 1 frame is composed of a ATM header, a SAPDU – H field having a function of fluctuation absorption, and a voice data field. Now referring to Fig. 3, functions of respective parts of the TLA 30 are described.

Please replace the third paragraph beginning on page 11, and continuing on page 12 with the following amended paragraph:

Fig. 4 is a chart showing operation sequence of the TLA, used for the voice switching system over the LAN, shown in Fig. 1, indicating directions of transmission and processing periods. The directions of transmission are denoted by the interface numbers shown in Fig. 1. Now referring to Fig. 4, operation of system is described hereinafter when call request, call or voice communication, and disconnection are performed between the voice telephone 5 juxtaposed-associated with the PC 1 and the voice telephone 8 juxtaposed-associated with the PC 4. Meanwhile, the LAN – HUB interface 30b, 40b and the LAN – SQ interfaces 30a, 40a of the TLAs 30 and 40, respectively, are

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assigned respective MAC addresses, and the voice telephones incorporated in the TLAs 30 and 40, respectively, are to be identified by VPI/VCI numbers in the ATM header shown in Fig. 3, or voice telephone numbers used in CTL bit shown in the figure. The PCs 1 to 4 or work stations and the NS unit 51 are also assigned respective MAC addresses requiring no particular conditions. Further, in the system according to this embodiment of the invention, for communication over interfaces other than the interfaces 5a, 30a, 40a, and 8a, a communication protocol, for example, TCP/IP is used.

Please replace the fifth paragraph beginning on page 14, and continuing on page 15 with the following amended paragraph:

The HWIF circuit 34 makes a selection on whether ~~an-a~~ descending voice channel is relayed to the AAL 1 circuit 33 or data for a silent pattern, howler, and ringer tone data are transmitted to the channel, according to a command from the PCU 36. The AAL 1 circuit 44 converts voice data transmitted from the interface package unit 30B via the HWIF circuit 34 into the ATM · AAL 1 frame (JT – I. 363) such that differences in arrival time of packetized voices over an asynchronous network, that is, fluctuation, can be absorbed. A range of packetization in the AAL 1 circuit 33 is as denoted by (i) in Fig. 3.

Please replace the first paragraph beginning on page 18, with the following amended paragraph:

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The voice telephone 8, upon receiving the ringer ON signal, notifies the user of arrival of the call by sounding BEEP. When the user of the voice telephone 8 unhooks a receiver, the voice telephone 8 notifies the TLA 40 via ~~an-a~~ going-up control channel of the voice interface 8a that the receiver is off the hook.

Please replace the fifth paragraph beginning on page 18, and continuing on page 19 with the following amended paragraph:

The TLA according to the second embodiment of the invention as described above, whereby even when the power supply source of a PC on the receiving end of the call request is turned OFF, a response is detected while arrival of the call request is notified to the user of a voice telephone on the call-in side by use of the control channel signals of the voice interface 8a of the voice telephone, has the same advantages as that of the TLA according to the first embodiment. Further, the TLA enables voice communication all the time as, for example, the voice telephone 8 can be called up even when the power source for the PC ~~juxtaposed-associated~~ therewith is off.

Please replace the second paragraph beginning on page 21, with the following amended paragraph:

- (1) In the voice switching system shown in Fig. 1, the NS unit 51 is connected to the NS switching unit 50; however, it may be connected instead to the LAN hubs 10, 20 at as an option.

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Please replace the first paragraph beginning on page 22, with the following amended paragraph:

(5) Fig. 8 is a block diagram showing a TLA having added functions. More effective use of a TLA can be made by providing the TLA with a function of voice compression and a function of transmitting and receiving facsimiles in addition to the functions of the system according to the fourth embodiment of the invention. In Fig. 8, a fax modem unit 70 and a voice compression unit 80 are provided at an input/output end of the TLA 30, on the LAN – HUB interface side. The fax modem unit 70 is constituted so as to be able to make conversions between analog and digital data, and is capable of making transmissions and receptions with an external network of G 3 FAX via a router. The voice compression unit 80 has a function of compressing voice data at variable compression rates of, for example, max. 8 kb/s. With the voice compression unit 80 provided, transmission and reception of compressed voice data with external networks can be performed.

Please replace the second paragraph beginning on page 22, with the following amended paragraph:

As described in detail hereinabove, the TLA according to the first embodiment of the invention enables voice communication over a LAN without need for a PBX, or the like.

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Please replace the fourth paragraph beginning on page 23, with the following amended paragraph:

With the method of communication according to the eighth **aspect** of the invention, the requirement for high capacity communication is met with greater ease in comparison with a PBX having limitations on the maximum capacity for accommodatable lines.